

### ABSTRACT OF THE DISCLOSURE

High-performance intermediate temperature solid oxide fuel cells (SOFCs). The SOFCs are ceria-based structures that can achieve a power output of 300mW/cm<sup>2</sup> at an operating temperature below 600°C. By way of example, the fuel cell as an anode made of NiO/doped-ceria, a thin film of doped-ceria and/or doped zirconia electrolyte is deposited on the anode, and a cathode of cobalt iron based material, such as (La, Sr)(Co, Fe)O<sub>3</sub> or cobalt, ion, magnesium based material, is deposited on top of the electrolyte, and can operate at a temperature of 550°C. The various layers may be deposited by colloidal spray deposition or aerosol spray casting.